

REMARKS

The Amendments

Claims 10 and 16 have been amended to better define the nature of the cure accelerant and to better define the polyalkylene polyamine and polyalkylene glycol polyamine cure accelerants. Claims 12, 13, 18, and 19 have been amended to recite particular accelerants. These amendments are supported in the application at paragraph 20, and add no new matter to the application. Applicant earnestly solicits entry of these amendments.

Claims 10 and 16 also have been amended to specifically recite that the claims are directed to resins used for binding wood and wood fiber products. This amendment is supported by paragraph 2 of the application, which describes use of the claimed resins for wood and wood fiber products. These amendments add no new matter to the application, and Applicant respectfully solicits entry thereof

Claims 11-13 and 17-19 are amended to correct an obvious typographical error in the amounts of accelerants present in the composition of the invention. The correct ranges are clearly set forth in paragraph 21 of the application, which supports this amendment. No new matter is added by the amendments, and Applicant earnestly solicits entry thereof.

The Invention

Claims 1-20 were pending in the application. Claims 1-9 are considered withdrawn as directed to a non-elected invention. The invention of claims 10-20 is directed to a curable resin composition for binding wood and wood fiber products. The resin comprises a curable phenol-aldehyde resin selected from the group consisting of resole resins and novolac resins comprising a source of free aldehyde, an effective amount of cyclic carbonate cure accelerant, and an effective amount of amine cure accelerant selected from the group consisting of polyalkylene polyamines, polyalkylene glycol polyamines, and blends thereof.

The Office Action

Claims 10-20 stand rejected under 35 U.S.C. § 102(b) as anticipated by Abstract XP-002226509 (“the Abstract”); under 35 U.S.C. § 103(a) as unpatentable over Gerber, United States Patent Number 5,294,649 (“Gerber”), or UK 1374332 (“UK ’332”). Applicant respectfully traverses these rejections. The Abstract does not disclose the claimed invention. Further, neither Gerber nor UK ’332 suggest the claimed invention.

The Prior Art

The *Abstract* discloses addition of ethylene carbonate and an alkaline substance. Preferred alkaline substances, and indeed the only described alkaline substances, are sodium hydroxide, potassium carbonate, magnesia, calcium hydroxide, and “amines, etc.” The ranges of additives are so broad as to be meaningless, and admit of having 4 parts additives to 1 part resin.

Gerber is directed to acceleration of the hardening rate of phenolic resole resins containing “lightburned magnesium oxide or magnesium hydroxide” alone or in combination with an ester-functional hardening agent by addition of “certain amines or with materials which increase the solubility of magnesium in the reaction mixture.” Col. 3, lines 22-25. Cyclic carbonates are included in a long list of compositions that can provide ester functionality. Selected strong basic tertiary amines are listed amongst many accelerators.

Gerber discloses that the resin, together with aggregates, is used for patching or resurfacing substrates, or to form shaped articles. Column 3, lines 45-55. These aggregates form part of the ‘raw batch composition’ described in Gerber. None of the “Fillers, Aggregates, and Modifiers” disclosed at column 14, line 65, to column 15, line 28, is an organic composition. Hexamethylene tetraamine is identified as an additive only in these aggregate-containing raw batch compositions.

In the “Applications” section of Gerber’s specification, which extends from column 15, line 65, to column 17, line 8, numerous aggregate-containing and other inorganic products, such as shaped refractory articles, bricks, coated abrasives, and polymer concrete, are disclosed. One line is reserved for “impregnated paper for use as auto oil and air filters.”

Gerber does not exemplify a system comprising a carbonate together with a polyalkylene polyamine or a polyalkylene glycol polyamine. Gerber does not exemplify application of the resin to an organic material, such as wood or a wood fiber product. Gerber does not exemplify manufacture of impregnated paper for use in filters. Gerber does not describe, suggest, or exemplify use of both an amine accelerant and a composition that solubilizes magnesium oxide or magnesium hydroxide.

Gerber’s exemplifications that do not include magnesium oxide or magnesium hydroxide, Example 9 and Example 13, are comparison examples. Example 9 is directed to Resin E, but “Resin E is not a resin used in this invention except for comparison purposes.” Column 19, lines 32-33. Example 13 compares resin compositions without magnesium oxide or magnesium hydroxide to compounds of the invention comprising magnesium hardener. The comparison shows that resin without magnesium oxide or magnesium hydroxide had not gelled after 14 days. Column 32, line 34 to column 35, line 5.

UK ‘332 discloses the combination of formamide as the major component and various compounds, including carbonates, as a minor component in a cure accelerant for phenolic resins.

Remarks

Applicant respectfully traverses the rejections. The cited art neither suggests nor discloses the claimed invention.

The Abstract

The Abstract does not disclose the invention as claimed. The abstract does not disclose use of polyalkylene polyamine and polyalkylene glycol polyamine cure accelerants in combination with cyclic carbonate cure accelerants, as required by the claims. Thus, Applicant respectfully traverses this anticipation rejection.

Gerber

Gerber neither suggests nor discloses the claimed invention. Gerber requires the presence of magnesium hydroxide or magnesia as the primary cure accelerant. The method disclosed by Gerber is intended to accelerate the hardening of a resin using a magnesium-containing compound as the primary hardening agent. Gerber teaches two ways to accomplish this result: add selected amines, or add a composition that solubilizes the magnesium-containing compound. The magnesium-containing compound is not sufficiently soluble in Gerber's resin.

Gerber discloses one organic substrate for this resin – filter paper. Gerber does not exemplify this use. Keeping in mind that Gerber teaches addition of either, but not both, a magnesium-compound solubilizing agent or a selected amine, a skilled practitioner would be led to selection of the solubilizing agent for the magnesium-containing compound in a Gerber resin to be used to impregnate filter paper. Use of the magnesium-compound solubilizing agent is required because, as Gerber teaches, the magnesium-containing compound is not sufficiently soluble in this resin. Therefore, in the Gerber system, undissolved solid magnesium-containing compound would be present in the resin.

Skilled practitioners recognize that undissolved solids are not acceptable in a resin to be used to impregnate filter paper and to bind other wood and wood fiber products. Therefore, one looking to Gerber for a resin to impregnate filter paper would be led to use of a solubilizer for the magnesium-containing compound in the resin to minimize undissolved solids therein. The skilled practitioner would not look to an added amine when working with wood products.

The argument that elimination of the magnesium component would have been obvious improperly ignores the teaching of the document cited. One cannot suggest that it would have been obvious to eliminate from the reference a component that the reference teaches must be present. The Office Action cites opinions that are said to require an unexpected result by elimination of magnesium-containing compound to render removal of that composition unobvious. The showing of unexpected result by eliminating the magnesium component is provided by the reference itself. Gerber teaches that the magnesium component is required. Example 13 of Gerber shows that, without magnesium-containing compound, resin utilizing an ester-functional agent and tetramethyl propane diamine did not gel.

Example 9 exemplifies, as comparison example, another aspect of this matter. Example 9 compares hardening times of a resin not using magnesium as a hardener. The Example shows that ethyl lactate alone hardens this comparison resin, and that additives have little or no effect. Example 9 further shows that the combination of another ester-functional compound, triacetin, together with various non-amine additives, hardens the resin even more quickly. However, this example says nothing relevant to the carbonate/amine-related invention claimed in the pending application.

Thus, Applicant respectfully traverses this rejection. Gerber teaches a skilled practitioner to use magnesium-compound solubilizer, rather than an amine, to accelerate hardening of a resin to be used to impregnate filter paper. Gerber simply does not suggest the claimed invention.

UK '332 does not suggest the claimed invention. This document describes the combination of formamide with, *inter alia*, a carbonate. However, formamide is not an amine — it is an amide. Thus, formamide includes a carbamoyl moiety (CONH₂). No such moiety is found in an amine. Applicant respectfully traverses this rejection, as UK '332 teaches nothing relevant to the claimed invention.

Conclusion

Applicant respectfully submits that the cited art neither suggests nor discloses the claimed invention for the reasons set forth above. Applicant respectfully submits that the claims are in condition for allowance and earnestly solicits favorable action thereon.

Respectfully submitted,

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